What is claimed is:

1. A variable valve train (1) for a cam-actuated lifting valve (13) of an internal combustion engine, which valve (13) is loaded by a closing spring (13a) acting against the direction of opening, with an approximately cylindrical force application element (2) located between a cam (14) and the valve (13), whose length can be adjusted hydraulically and whose exterior cylindrical wall face (3) is slidable in a fixed guide cylinder (4), said element (2) being provided with a pressure piston (6) longitudinally slidable in a cylinder (5), which piston (6) is adjacent to a pressure chamber (7) into which opens a pressure channel (8) departing from a port (9) in the wall face (3) of the force application element (2), a fixed pressure line (11) opening into the guide cylinder (4) in the area of the port (9), which line (11) can be subjected to hydraulic high pressure (p_H) permitting hydraulic activation of the valve (13), wherein a permanent flow connection is provided between pressure line (11) and pressure channel (8) independently of the position of the force application element (2).

2. A valve train (1) according to claim 1, wherein the end (11a) of the pressure line (11) opening into the guide cylinder (4) and the port (9) in the wall face (3) of the force application element (2) are designed to be overlapping in every position.

3. A valve train (1) according to claim 1 or 2, where the force application element (2) can perform a lift corresponding to the cam lift, wherein a recess (12) is provided between pressure line (11) and pressure channel (8), which communicates with both pressure line (11) and

pressure channel (8), the height (h) of which recess (12), as measured in the direction of the lift, will correspond to at least the maximum lift of the force application element (2).

4. A valve train (1) according to claim 3, wherein the recess (12) is configured at least partially by a space in the guide cylinder (4).

5. A valve train (1) according to claim 3 or 4, wherein the recess (12) is configured at least partially by a space in the exterior wall face (3) of the force application element (2).

6. A valve train (1) according to any of claims 1 to 5, wherein the force application element (2) is located between the cam (14) and the lifting valve (13), and preferably, it is coaxial with the valve (13), and more preferably it is configured as a cup-shaped tappet.

7. A valve train (1) according to any of claims 1 to 5, wherein the force application element (2) is configured as part of a valve arm bearing block supporting a valve arm for actuation of the lifting valve (13).

8. A valve train (1) according to any of claims 1 to 5, wherein the force application element (2) is located between a cam (14) and a valve arm for actuation of the lifting valve.

9. A valve train (1) according to any of claims 1 to 8, wherein the pressure line (11) is connected to an external pressure generating unit (16) comprising at least one pump (17, 28), and at least one pressure tank (18, 21) with at

least one pressure regulator (20), and at least one pressure control element (19).

10. A valve train (1) according to claim 9, wherein the pressure control element (19) is configured as an electromechanical element with at least one electromechanically actuated valve.

11. A valve train (1) according to claim 9 or 10, wherein the pressure control element (19) is configured as a piezo-mechanical element with at least one piezomechanically actuated valve.

12. A valve train (1) according to any of claims 9 to 11, wherein several lifting valves (13) can be actuated by means of one and the same pressure control element (19).

13. A valve train (1) according to any of claims 9 to 12, wherein the pressure control element (19) is configured as a 3/2-way valve.

14. A valve train (1) according to any of claims 9 to 13, wherein the working medium and/or control medium of the pressure generating unit (16) is water, fuel, or lubricating oil.

15. A valve train (1) according to any of claims 1 to 13, wherein the pressure generating unit (16) is part of a further subsystem of the engine other than the valve train.

16. A valve train (1) according to claim 15, wherein the pressure tank (18, 21) is part of a fuel injection system.

17. A valve train (1) according to claim 15, wherein the pressure tank (18, 21) is part of an hydraulic gear system of the vehicle.

18. A valve train (1) according to claim 15, wherein the pressure tank (18, 21) is part of an hydraulic braking system of the vehicle.

19. A valve train (1) according to claim 15, wherein the pressure tank (18, 21) is part of a coolant circulation system of the vehicle.

20. A valve train (1) according to any of claims 9 to 19, wherein the pressure generating unit (16) has a high pressure level (p_H) and a medium pressure level (p_M), permitting the pressure chamber (7) of the force application element (2) to be flow-connected to either high pressure level (p_H) or medium pressure level (p_M) via the pressure control element (19), the high pressure level (p_H) preferably being provided by a high pressure tank (18) connected to a high pressure pump (17).

21. A valve train (1) according to claim 20, wherein the medium pressure level (p_M) is provided by a medium pressure pump (28).

22. A valve train (1) according to claim 20, wherein the medium pressure level (p_M) is provided by a medium pressure tank (21), which is connected via a relief valve (22) to a high pressure tank (18) for the high pressure level (p_H).

23. A valve train (1) according to any of claims 9 to 22, wherein the force application element (2) is connected to

the medium pressure level (p_M) via a pressure relief line (26) preferably provided with a check valve (27) opening in the direction of the force application element (2).

24. A valve train (1) according to any of claims 1 to 23, wherein the pressure piston (6) is designed as a stepped piston.

25. A method for operating an internal combustion engine with a variable valve train according to any of claims 1 to 24, wherein the lifting valve will be hydraulically activated and given an additional lift during the mechanical lifting phase performed by the cam.

26. A method for operating an internal combustion engine with a valve train according to any of claims 1 to 24, wherein the lifting valve will be re-opened hydraulically at least once after the mechanical lifting phase performed by the cam has come to an end.

27. A method for operating an internal combustion engine with a valve train according to any of claims 1 to 24, wherein the lifts of subsequent charge exchange processes are alternatingly determined mechanically and hydraulically.